



INVITATION FOR BIDS
OFFICE OF PROCUREMENT & CONTRACTS

1. INSTRUCTIONS FOR BIDDERS

- a. Sealed bids will be received in the Office of Procurement & Contracts, Mississippi State University, for the purchase of the items listed herein.
- b. All bids must be received in the Office of Procurement & Contracts on or before the bid opening time and date listed herein. Delivery of bids must be during normal working hours, 8:00 a.m. to 5:00 p.m. CST, except on weekends and holidays when no delivery is possible.
- c. Bidders shall submit their bids either electronically or in a sealed envelope. To submit electronically, follow the instructions below. Bids CANNOT be emailed.
 - i. Sealed bids should include the bid number on the face of the envelope as well as the bidders' name and address. Bids should be mailed to: 245 Barr Avenue, 610 McArthur Hall, Mississippi State, MS 39762.
 - ii. At this time we only accept non-ITS bids electronically. For electronic submission of bids, go to: <https://portal.magic.ms.gov> and use the RFX number on the next page as your reference number.
- d. All questions regarding this bid should be directed to the Office of Procurement & Contracts at 662-325-2550.

2. TERMS AND CONDITIONS

- a. All bids should be bid "FOB Destination"
- b. Bidders must comply with all rules, regulations, and statutes relating to purchasing in the State of Mississippi, in addition to the requirements on this form. General Bid Terms and Conditions can be found here:
https://www.procurement.msstate.edu/procurement/bids/Bid_General_Terms_May_2019_V2.pdf
- c. Any contract resulting from this Invitation for Bid shall be in substantial compliance with Mississippi State University's Standard Contract Addendum:
<https://www.procurement.msstate.edu/contracts/standardaddendum.pdf>

Bid Number/RFX Number: 22-85/RFX#3160005111

Opening Date: May 24, 2022 @2:00 p.m.

Description: 140 Ton Air Cooled Scroll Water Chiller

Vendor Name: _____

Vendor Address: _____

Telephone Number: _____

Days the Offer is Firm: _____

Authorized Signature: _____

Name: _____

Title: _____

Item	Quantity	Description	Unit Price	Total Price
1	1	140 Ton Air Cooled Scroll Water Chiller As per attached specifications		

HPCC SIMS Chiller - WR# 445877

SECTION – SCROLL WATER CHILLERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Additional information is contained in the "Air Cooled Chiller Schedule". Refer to the schedule for performance data and specific equipment requirements.

1.2 SUMMARY

- A. This Section includes packaged, air-cooled, electric-motor-driven, rotary-screw water chillers with the following features:
 - 1. Motor controller.
 - 2. Microprocessor-based controls complying with ASHRAE 135.

1.3 DEFINITIONS

- A. EER: Energy-efficiency ratio.
- B. IPLV: Integrated part-load value.

1.4 SUBMITTALS

- A. Product Data: Include refrigerant, rated capacities, operating characteristics, furnished specialties, and accessories.
- B. Shop Drawings: Complete set of manufacturer's certified prints of water chiller assemblies, control panels, sections, and elevations, and unit isolation. Include the following:
 - 1. Assembled unit dimensions.
 - 2. Operating weight and load distribution.
 - 3. Required clearances for maintenance and operation.
 - 4. Size and location of piping and wiring connections.
 - 5. Wiring Diagrams: Power, signal, and control wiring.
- C. Coordination Drawings: Floor plans drawn to scale and coordinated with the following:
 - 1. Structural supports.
 - 2. Piping roughing-in requirements.
 - 3. Wiring roughing-in requirements, including spaces reserved for electrical equipment.
 - 4. Access requirements, including working clearances for mechanical controls and electrical equipment, and tube pull and service clearances.

HPCC SIMS Chiller - WR# 445877

- D. Certificates: For certification required in "Quality Assurance" Article.
- E. Source quality-control test reports.
- F. Startup service reports.
- G. Operation and Maintenance Data: For each water chiller to include in emergency, operation and maintenance manual.
- H. Warranties: Special warranties specified in this Section.

1.5 SUBSTITUTIONS

- A. Acceptable Manufacturers: Manufacturers, materials, and methods described in this Specification Section are intended to establish a standard of quality only. It is not the intention of the Engineer to discriminate against any product, material or method that is equal to the standards as indicated and/or specified, nor is it intended to preclude open, competitive bidding. The fact that a specific manufacturer is listed as an acceptable manufacturer should not be interpreted to mean that the manufacturers' standard product will meet the requirements of the specifications. The manufacturer of the product shall be responsible for offering a product that is compliant with the specification and shall make the Purchaser aware of any requirements that may be interpreted as non-compliant by the Engineer. The Engineer shall be the sole judge of quality and equivalence of equipment, materials, and methods.

1.6 QUALITY ASSURANCE

- A. ARI Certification: Signed by manufacturer certifying compliance with requirements in ARI 550/590, "Water Chilling Packages Using the Vapor Compression Cycle."
- B. ASHRAE Certification: Signed by manufacturer certifying compliance with ASHRAE 23 for safety code for mechanical refrigeration. Comply with ASHRAE Guideline 3 for refrigerant leaks, recovery, and handling and storage requirements.
- C. ASME Compliance: Fabricate and label water chiller heat exchangers to comply with ASME Boiler and Pressure Vessel Code: Section VIII, Division I.
- D. Comply with NFPA 70.
- E. Comply with UL 1995.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Ship water chillers from the factory fully charged with refrigerant or nitrogen.

HPCC SIMS Chiller - WR# 445877

1.8 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of water chillers that fail in materials or workmanship. .
- B, Warranty Period for Sealed Refrigeration System: Manufacturer's standard, but not less than five years from date of Substantial Completion, including components (i.e. compressors, refrigerant piping, specialties, refrigerant, etc.) and labor.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include the following:
 - 1. Daikin Applied.
 - 2. Johnson Controls Inc.
 - 3. Trane Company (The).
 - 4. Approved Equal.

2.2 PACKAGED WATER CHILLERS

- A. Description: Factory-assembled and -tested water chiller complete with casing, compressor, heat exchanger, condenser coils and fans, and controls integrated with compressor operation.
 - 1. Casing: Weatherproof, constructed of hot-dip galvanized steel with factory-painted finish.
 - 2. Fans: Propeller type, statically and dynamically balanced, with vertical air discharge for high efficiency and low sound; located in its own compartment to eliminate cross flow of condenser air during fan cycling; and equipped with heavy-gage, weather-protected fan guard.
 - 3. Fan Motor: Direct drive, weatherproof, with bearings permanently lubricated, and having built-in current- and thermal-overload protection.
- B. Fabricate water chiller mounting frame and attachment to the pressure vessel with reinforcement strong enough to resist water chiller movement during a seismic event when the water chiller mounting frame is anchored to the building structure.

2.3 COMPRESSORS

- A. 460V Scroll Compressor.

HPCC SIMS Chiller - WR# 445877

- B. Description: Positive displacement, oil injected with direct-drive, hermetically sealed motor.
 - 1. Casing: Cast iron, precision machined for minimum clearance about periphery of rotors.
 - 2. Multiple Scroll compressor set-up.
- C. Capacity Control: Hydraulically operated, modulating or stepped sliding valve to maintain chilled-water temperature set point without hunting within throttling range. Throttling range shall be from 100 to 10 percent of full load.
- D. Oil Lubrication System: Positive-displacement submersible pump with heater, oil filter, and sight glass.
- E. Refrigerant and Oil: HFC-134a.
- F. Refrigerant Compatibility: Seals, O-rings, motor windings, and internal water chiller parts exposed to refrigerants shall be fully compatible with refrigerants, and pressure components shall be rated for refrigerant pressures.
- G. Refrigerant Circuit: Two independent circuits. Each circuit shall include an electronic expansion valve, compressor suction and discharge shutoff valves, a liquid-line shutoff valve, a replaceable-core filter drier, a sight glass with moisture indicator, a liquid-line solenoid valve, and an insulated suction line.

2.4 HEAT EXCHANGERS

- A. Evaporator:
 - 1. Description: Shell-and-tube design, ASME labeled.
 - 2. Shell Material: Carbon steel.
 - 3. Tube Construction: Individually replaceable, expanded into tube sheets.
 - a. Material: Copper.
 - b. Internal Finish: Enhanced.
 - 4. Water Box: Standard, with design working pressure of 230 psig, and having grooved mechanical-joint coupling water-nozzle connections with a thermistor-type temperature sensor factory installed in each nozzle.
- B. Air-Cooled Condenser: Copper tubes with mechanically bonded aluminum, integral subcooling circuit, leak tested at 450 psig.
 - 1. Safety and Operating Options: Low-ambient controls for operation down to 0 deg F.
 - 2. Condenser to have factory mounted, coil guards.

HPCC SIMS Chiller - WR# 445877

2.5 INSULATION

- A. Cold Surfaces: Closed-cell, flexible elastomeric, thermal insulation complying with ASTM C 534, Type II, for sheet materials.
 - 1. Thickness: 1 1/4 inches.
 - 2. Adhesive: As recommended by insulation manufacturer.
 - 3. Factory apply insulation over entire surfaces of water chiller components.
 - a. Apply adhesive to 100 percent of insulation contact surface.
 - b. Seal seams and joints.
 - c. After adhesive has fully cured, apply two coats of protective coating to insulation.

2.6 ACCESSORIES

- A. Pressure Relief Valve: Single- or multiple-reseating-type, spring-loaded relief valve.
- B. Paddle Flow Switches:
 - 1. Vane operated to actuate a double-pole, double-throw switch with one pole field wired to the chiller control panel and the other pole field wired to the BAS.
 - 2. Contacts: Platinum alloy, silver alloy, or gold-plated switch contacts with a rating of 10 A at 120-V ac.
 - 3. Pressure rating equal to pressure rating of heat exchanger.
 - 4. Construct body and wetted parts of Type 316 stainless steel.
 - 5. House switch in a NEMA 250, Type 4 enclosure constructed of die-cast aluminum.
 - 6. Vane length to suit installation.
- C. Vibration Isolation:
 - I. Neoprene Pad:
 - a. Two layers of 0.375-inch-thick, ribbed- or waffle-pattern neoprene pads separated by a 16-gage, stainless-steel plate.
- D. Condenser Louvered Panels: Multiple removable louvered panels to cover the entire condenser coil area.
- E. Compressor Louvered Panels: Multiple removable louvered panels to cover the compressor and evaporator area beneath the condenser coil area.
- F. Disconnect Switch: Single point electrical service with factory mounted disconnect switch.
- G. Inlet Strainer: Inlet strainer sized for chiller design flow with strainer mesh according to manufacturer's recommendations.

HPCC SIMS Chiller - WR# 445877

2.7 CONTROLS

- A. Control Panel: Stand-alone, microprocessor based. Provide communication interface with building automation system via BACnet protocol.
- B. Enclosure: Unit-mounted, NEMA 250, Type 3R enclosure, hinged or lockable; factory wired with a single-point power connection and a separate control circuit.
- C. Status Display: Multiple-character liquid-crystal display or light-emitting diodes and keypad. Display the following conditions:
 - 1. Date and time.
 - 2. Operating or alarm status.
 - 3. Operating hours.
 - 4. Outside-air temperature if required for chilled-water reset.
 - 5. Temperature and pressure of operating set points.
 - 6. Entering and leaving temperatures of chilled water.
 - 7. Refrigerant pressures in evaporator and condenser.
 - 8. Saturation temperature in evaporator and condenser.
 - 9. Oil temperature and pressure.
 - 10. Percent of maximum motor amperage.
 - 11. Current-limit set point.
 - 12. Number of compressor starts.
- D. Control Functions:
 - 1. Manual or automatic startup and shutdown time schedule.
 - 2. Entering and leaving chilled-water temperature, control set points, and motor load limit.
 - 3. Chilled-water temperature shall be reset based on return-water temperature.
 - 4. Current limit and demand limit.
 - 5. External water chiller emergency stop.
- E. Manually Reset Safety Controls: The following conditions shall shut down water chiller and require manual reset:
 - 1. Low evaporator pressure; high condenser pressure.
 - 2. Low chilled-water temperature.
 - 3. Low oil differential pressure.
 - 4. High or low oil pressure.
 - 5. High oil temperature.
 - 6. High compressor-discharge temperature.
 - 7. Loss of chilled-water flow.
 - 8. Electrical overload.
 - 9. Loss of Phase

HPCC SIMS Chiller - WR# 445877

- 10. Sensor- or detection-circuit fault.
- 11. Starter fault.

2.8 MOTORS

- A. Motor Sizes: Minimum size as indicated. If not indicated, large enough so driven load will not require motor to operate in service factor range above 1.0.

2.9 MAGNETIC ENCLOSED CONTROLLERS

- A. Enclosure: Unit mounted, NEMA 250, Type 3R, with hinged access door with lock and key or padlock and key.
- B. Control Circuit: 120 V; obtained from integral control power transformer with a control power transformer of enough capacity to operate connected pilot and indicating and control devices.
- C. Overload Relay: Shall be sized according to UL 1995 or shall be an integral component of water chiller control microprocessor.
- D. Star-Delta, Reduced Voltage Controller: NEMA ICS 2, closed transition.
- E. Accessories: Devices shall be factory installed in controller enclosure, unless otherwise indicated.
 - 1. Phase-Failure and Undervoltage Relays: Solid-state sensing circuit with adjustable undervoltage setting and isolated output contacts for hard-wired connections.

2.10 SOURCE QUALITY CONTROL

- A. Factory test and rate water chillers, before shipping, according to ARI 550/590, "Water Chilling Packages Using the Vapor Compression Cycle." Stamp with ARI label.
- B. Factory test heat exchangers hydrostatically at 1.50 times the design pressure.
- C. Factory test and inspect evaporator and water-cooled condenser according to ASME Boiler and Pressure Vessel Code: Section VIII, Division 1. Stamp with ASME label.
- D. Factory test and inspect water boxes at 230 percent of working pressure.
- E. Rate sound power level according to ARI 575 procedure.
- F. Rate sound power level according to ARI 370 procedure.
- G. Allow Owner access to places where water chillers are being source quality-control tested. Notify Architect / Engineer 14 days in advance of testing.

HPCC SIMS Chiller - WR# 445877

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Before water chiller installation, examine roughing-in for concrete equipment bases, anchor-bolt sizes and locations, piping, and electrical to verify actual locations, sizes, and other conditions affecting water chiller performance, maintenance, and operations.
 - 1. Final water chiller locations indicated on Drawings are approximate. Determine exact locations before roughing-in for piping and electrical connections.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 WATER CHILLER INSTALLATION

- A. Install water chillers on concrete base. Concrete base is specified in Division 23 Section "Basic Mechanical Materials and Methods," and concrete materials and installation requirements are specified in Division 3.
- B. Concrete Bases: Anchor chiller mounting frame to concrete base.
 - 1. For supported equipment, install epoxy-coated anchor bolts that extend through concrete base and anchor into structural concrete floor.
 - 2. Place and secure anchorage devices. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
 - 3. Install anchor bolts to elevations required for proper attachment to supported equipment.
 - 4. Cast-in-place concrete materials and placement requirements are specified in Division 3.
- C. Vibration Isolation: Rubber pads with a minimum deflection of 0.25 inch. Vibration isolation devices and installation requirements are specified in Division 23 Section "Mechanical Vibration and Seismic Controls."
- D. Maintain manufacturer's recommended clearances for service and maintenance.
- E. Charge water chiller with refrigerant if not factory charged.
- F. Install separate devices furnished by manufacturer.

3.3 CONNECTIONS

- A. Chilled- and condenser-water piping installation requirements are specified in Division 23 Section "Hydronic Piping." Drawings indicate general arrangement of piping, fittings, and specialties.

HPCC SIMS Chiller - WR# 445877

- B. Install piping adjacent to chiller to allow service and maintenance.
 - C. Evaporator Connections: Connect inlet to evaporator with inlet strainer, controller-bulb well, shutoff valve, thermometer, pressure gage, and union or flange. Connect outlet to evaporator with shutoff valve, flow switch, thermometer, pressure gage, and union or flange.
 - D. Ground water chillers according to Division 26 Section "Grounding and Bonding."
 - E. Connect wiring according to Division 26 Section "Conductors and Cables."
 - F. Tighten electrical connectors and terminals according to manufacturer's published torque tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.
- 3.4 STARTUP SERVICE
- A. Engage a factory-authorized service representative to perform startup service.
 - B. Inspect field-assembled components, equipment installation, and piping and electrical connections for proper assemblies, installations, and connections.
 - C. Complete installation and startup checks according to manufacturer's written instructions and perform the following:
 - 1. Verify that refrigerant charge is sufficient and water chiller has been leak-tested.
 - 2. Verify that pumps are installed and functional.
 - 3. Verify that thermometers and gages are installed.
 - 4. Operate water chiller for run-in period according to manufacturer's written instructions.
 - 5. Check bearing lubrication and oil levels.
 - 6. Verify proper motor rotation.
 - 7. Verify static deflection of vibration isolators, including deflection during water chiller startup and shutdown.
 - 8. Verify and record performance of chilled-water flow and low-temperature interlocks.
 - 9. Verify and record performance of water chiller protection devices.
 - 10. Test and adjust controls and safeties. Replace damaged or malfunctioning controls and equipment.
 - D. Prepare a written startup report that records results of tests and inspections.

HPCC SIMS Chiller - WR# 445877

- E. Occupancy Adjustments: When requested within 12 months of date of Substantial Completion, provide on-site assistance in adjusting system to suit actual occupied conditions. Provide up to two visits to site outside normal occupancy hours for this purpose.

3.5 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain water chillers. Refer to Division 1 Section "Closeout Procedures."

END OF SECTION